



# Qualcomm® Robotics RB3 Platform (SDA/SDM845)

**A dedicated robotics platform designed to accelerate computing and intelligence capabilities for consumer and industrial robotics.**

The Qualcomm Robotics RB3 Platform supports the development of smart, power-efficient and cost-effective robots by combining high-performance heterogeneous computing, Qualcomm® Artificial Intelligence (AI) Engine for on-device machine learning, computer vision, hardware-based security, multimedia and Wi-Fi and cellular connectivity.

Comprised of a comprehensive set of hardware, software and tools, the Qualcomm Robotics RB3 platform is designed to help manufacturers and developers create robotic products ranging from large industrial and enterprise robots to small battery-operated ones with challenging power and thermal dissipation requirements.

Our Robotics RB3 platform allows for flexible design options for development and commercialization - from development board offerings for prototyping, to off-the-shelf system-on-module solutions to speed commercialization, to the flexibility for chip-on-board designs for cost-optimization at scale.

The Qualcomm Robotics RB3 hardware development kit contains a robotics-focused DragonBoard™ 845c development board, based on the Qualcomm® SDA/SDM845 SoC and compliant with the 96Boards open hardware specification to support a broad range of mezzanine-board expansions. The platform supports Linux and includes support for FastCV, Qualcomm® Neural Processing software development kit (SDK) for advanced on-device AI, Qualcomm® Hexagon™ DSP SDK, and Robot Operating System (ROS).

## Highlights

### On-device intelligence powered by the Qualcomm AI Engine

The Qualcomm AI Engine on the Qualcomm Robotics RB3 Platform includes our Neural Processing SDK, which encompasses analysis, optimization, and debugging tools designed to allow developers and manufacturers to port trained deep learning networks on the various heterogeneous compute blocks offered by the platform.



### Power efficient and cost-effective

Our Robotics RB3 Platform is designed to support large industrial and enterprise devices as well as small battery-operated robots with challenging power and thermal dissipation requirements.



### Comprehensive development kit

Further reduce development time and complexity for intelligent high-performance robots using a feature packed development kit. The kit includes the 96Boards compliant, robotics-focused DragonBoard 845c for supporting a broad range of mezzanine-board expansions and range of sensor support like time-of-flight (ToF), active stereo camera, multi-mic, IMU and proximity.



### Flexible design options for commercialization

In addition to a feature packed development kit, the platform offers a range of solutions for commercialization from off-the-shelf System-on-Module (SoM) solutions to speed commercialization, to the flexibility for chip-on-board designs for cost-optimization at scale.





# Qualcomm Robotics RB3 Platform Applications

- Face Detection & Recognition
- Object Depth and Avoidance
- Gesture and Hand Tracking
- Path Planning & 3D Map Formation
- Deep Learning

## Features

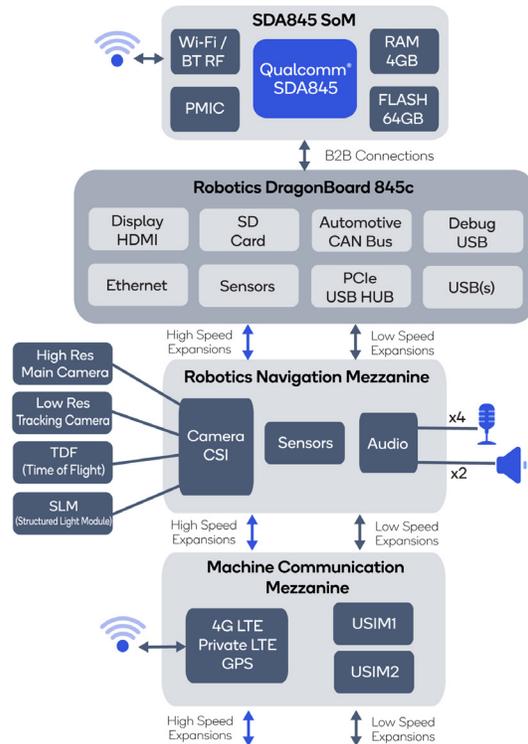
- Qualcomm Spectra™ 280 ISP designed to deliver a premium camera experience, with high-performance capture of up to 16 MP at 60 images per second
- Qualcomm® Adreno™ 630 Visual Processing Subsystem delivers larger-than-life immersive experiences using the graphics processing unit (GPU) and video processing unit (VPU)
- Third generation Hexagon 685 DSP supports sophisticated, on-device AI processing, and delivers mobile-optimized computer vision (CV) experiences for wide-array of use cases
- Qualcomm® Kryo™ 385 CPU: Manufactured in 10nm LPP, optimized across four performance and four efficiency cores
- Qualcomm® Processor Security including: secure boot, cryptographic accelerators, Qualcomm® Trusted Execution Environment and camera security

## Software

- Software support for Linux and ROS
- Qualcomm® Neural Processing SDK: Optimizing deep learning processing performance across available resources to achieve superior edge computing experience.
- Qualcomm® Computer Vision SDK: Offers a mobile-optimized computer vision (CV) library which enables new user experiences like gesture recognition, face detection, tracking and recognition, augmented reality and more.
- Hexagon DSP SDK: Designed to optimize the features and performance of multimedia software. These optimizations help allow audio, imaging, embedded vision and heterogeneous computing acceleration on the Hexagon DSP to create compelling multimedia user experiences.

To learn more visit: [www.qualcomm.com](http://www.qualcomm.com) or [www.developer.qualcomm.com](http://www.developer.qualcomm.com)

## Platform Block Diagram



## Platform Specifications

	Qualcomm Robotics RB3 Platform
<b>CPU</b>	SDA/SDM845 8x Kryo 385 CPU, up to 2.8 GHz
<b>ISP</b>	Qualcomm Spectra 280 Image Signal Processor
<b>Camera</b>	Single HFR 16 MPix camera @ 60fps ZSL, Dual 16 MPix cameras @ 30fps ZSL, Single 32 MPix camera at 30fps ZSL
<b>Video</b>	Ultra HD Premium video capture @ 4K (3840x2160) 60fps, 10bit HDR, Rec 2020 color gamut; H.264 (AVC), H.265 (HEVC) and VP9 support; Slow motion HEVC video encoding of either HD (720p) video up to 4-80fps or FHD (1080p) up to 240fps
<b>GPU</b>	Adreno 630 GPU with support for Open GL ES 3.2 and Open CL 2.0
<b>DSP</b>	Hexagon 685 DSP with 3rd Gen Vector Extensions
<b>Memory &amp; Storage</b>	LPDDR4x, 4x16 bit; up to 1866MHz, 8GB RAM
<b>Wireless Connectivity</b>	Wi-Fi integrated 802.11ac 2x2 with MU-MIMO; Tri-band Wi-Fi: 2.4 GHz and 5 GHz with Dual Band Simultaneous (DBS), Bluetooth 5.0
<b>Audio</b>	Qualcomm TrueWireless™ Stereo
<b>Location</b>	GPS, Glonass, BeiDou, Galileo, QZSS, and SBAS

Qualcomm Computer Vision SDK, Qualcomm Spectra, Qualcomm Adreno, Qualcomm Kryo, Qualcomm Processor Security, Qualcomm Trusted Execution Environment and Qualcomm TrueWireless are products of Qualcomm Technologies, Inc. and/or its subsidiaries.

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